REMARKS

Claims 1 – 8 are pending in the present Application. Claims 1, 4, 5, and 8 have been cancelled, Claims 2, 3, 6, and 7 have been amended, and Claims 9 – 16 have been added, leaving Claims 2, 3, 6, 7, and 9 – 16 for consideration upon entry of the present Amendment. The Specification has been amended to correct certain typographical errors.

The claims have been amended to remove unnecessary limitation, place dependent claims in independent form, and correct dependency.

The new claims have been added to further claim various embodiments of the invention. Support for the new claims can be found in the Specification and claims as originally filed, for example, in Figure 1, and on page 10, line 10 – page 11, line 4.

No new matter has been introduced by these amendments. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1 – 8 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Bohn et al. (U.S. Patent No. 6,306,907) in view of Benham et al. (U.S. Patent No. 6,534,552). Applicants respectfully traverse this rejection.

Bohn et al. teach a process for producing power, carbon dioxide, and hydrocarbons having an average H:C atom ratio of 2 or greater from carbon-bearing feedstocks having an H:C atom ratio of less than 2, comprising the steps of:

> a) reacting a carbon-bearing feedstock with an oxidizing gas... and steam in a partial oxidation reactor to produce a mixture of gases containing hydrogen and carbon monoxide having a molar ratio of H_2:CO of greater than 0.6;
>
> b) reacting the mixture of gases containing hydrogen and carbon monoxide in a Fischer-Tropsch synthesis reactor containing a catalyst which catalyzes both hydrocarbon-forming reactions and the water gas shift reaction;
>
> c) condensing the product hydrocarbons from unreacted hydrogen, carbon monoxide and other gases (tail gases);
>
> d) separating the product hydrocarbons into naphtha, diesel and wax fractions;
>
> e) removing at least a portion of carbon dioxide from the tail gases; and

> f) producing steam from heat recovered from at least said partial oxidation reactor and the Fischer-Tropsch reactor, directing the steam to the steam turbine of a combined cycle plant, and directing at least the tail gases to the gas turbine of said combined cycle plant to produce power.
>
> Optionally, hydrogen can be separated from the tail gases and utilized for recycle to the partial oxidation reactor and/or hydrocracking wax F-T products to form more liquid hydrocarbon products.

(Col. 7, line 41 – Col. 8, line 1)

Benham et al. are relied upon for teaching "that carbon dioxide is removed from the tail gas exiting from the Fischer-Tropsch reactor and recycling at least a portion of the carbon dioxide to the inlet of the synthesis gas production reactor (see col. 2, lines 58-65)." (Office Action dated June 13, 2003, pages 4 - 5) The two sections of Benham et al. referred to in the Office Action state:

> Benham et al. (U.S. Pat. Nos. 5,620,670 and 5,621,155) teach that **carbon dioxide recycle** (including carbon dioxide produced in the synthesis step) **back to the synthesis gas producing step** (either partial oxidation, autothermal reforming or steam reforming) decreases the excessively high H_2:CO ratio of the synthesis gas and **increases the yield of the Fischer-Tropsch (FT) hydrocarbons** and the attendant carbon conversion-efficiency. The aforementioned patents also teach that recycling both tail gas and carbon dioxide back to the synthesis gas producing step can be used to effect an increase in hydrocarbon yields.

(Col. 1, lines 53 – 62; **emphasis** added), and

> [D]epending on the nature of the oxidizing gas used in the synthesis gas production reactor, the nature of the catalyst in the FT reactor, and whether a POX or ATR unit is employed, (1) a tail gas recycling system may be employed for recycling at least a portion of the remaining tail gas, either before or after the hydrogen has been removed, to the inlet of the synthesis gas production reactor or (2) a carbon dioxide gas separating and recycling system may be employed for separating the carbon dioxide from the tail gas exiting from the FT reactor and **recycling at least a portion of the carbon dioxide to the inlet of the synthesis gas production reactor**.

(Col. 2, lines 54 – 65; **emphasis** added) Benham et al. teach recycling carbon dioxide.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are

disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Allegedly, due to the teachings of Bohn et al. in view of Benham et al. "it would have been obvious to one of ordinary skill in the art at the time the invention was made to mix the **carbon dioxide free tail gas** with the synthesis gas in order to increase the yield of the Fischer-Tropsch hydrocarbons and the attendant carbon conversion efficiency. (Office Action dated June 13, 2003, page 5; **emphasis** added) Applicants respectfully disagree.

As is clear from Benham et al., they teach that recycling carbon dioxide "increases the yield of the Fischer- Tropsch (FT) hydrocarbons", and not that recycling a stream from which the carbon dioxide has been removed will increase the yield. (Col. 1, lines 53 – 59) They further teach "recycling at least a portion of **the carbon dioxide** to the inlet of the synthesis gas production reactor", they fail to teach removing carbon dioxide from at least a portion of the tail-gas and mixing that portion of the tail-gas with the synthesis gas. Additionally, there is no motivation to remove the carbon dioxide and to then mix that stream with the synthesis gas. It is not important what an artisan could do, but what they would do. Based upon the teachings of Benham et al. and Bohn et al., a artisan would not be motivated to remove carbon dioxide from a portion of the tail-gas and to combine that portion with the synthesis gas.

It is further noted that Benham et al. teach carbon dioxide recycle to the inlet of the synthesis gas production reactor, while Bohn et al. discuss the disadvantages of carbon dioxide. "[T]he amount of tail gas recycle is limited by the resulting low H_2:CO ratio in the synthesis gas produced in the POX caused by the large amount of CO_2 in the tail gas." (Col. 4, lines 4 – 9) Hence, there is no motivation to combine Bohn et al. with Benham et al. since Benham et al. recycle carbon dioxide to the POX reactor.

Neither reference, alone, nor in combination, teach removing carbon dioxide from at least a portion of the tail-gas and then mixing that portion of the tail gas with the synthesis gas (e.g., the gas produced in the synthesis gas production reactor). They teach the desirability of recycling the carbon dioxide back to the synthesis gas production reactor. For at least these reasons, these references fail to teach all of the elements of the present claims and therefore fail to render the present claims obvious.

It is believed that the foregoing amendments and remarks fully comply with the Final Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the rejection and allowance of the case are respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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